

Research and Monitoring Plan for Atlantic King Mackerel Along the U.S. Atlantic Coast

1. Introduction

Atlantic Migratory Group King Mackerel (*Scomberomorus cavalla*) is a key species in commercial and recreational fisheries along the U.S. Atlantic coast. Effective management requires robust research and monitoring efforts guided by assessments conducted through the Southeast Data, Assessment, and Review (SEDAR) process and amendments to the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources in the Gulf of Mexico and Atlantic Regions. This plan outlines strategies to enhance data collection, stock assessments, and management.

2. Objectives

- Improve stock assessment accuracy through comprehensive data collection.
- Enhance fishery-dependent and fishery-independent monitoring programs.
- Evaluate the impacts of fishing regulations on stock health, fishery sustainability and fishing communities.
- Identify research priorities for habitat, migration patterns, and environmental influences.
- Strengthen cooperative management and stakeholder engagement.

3. Data Collection and Stock Assessments

3.1 Fishery-Dependent Data Collection

- **Commercial Landings and Effort Surveys:** Continue mandatory reporting of commercial catches through state and federal programs.
- **Recreational Catch Surveys:** Utilize the Marine Recreational Information Program (MRIP) for angler catch estimates.
 - Consider new methods to collect recreational catch data
 - Enhance angler reporting through mobile applications and citizen science initiatives.
- **Observer Programs:** Expand observer coverage to improve bycatch estimates and validate self-reported data.
- **Electronic Reporting and Logbooks:** Enhance electronic monitoring to improve timeliness and accuracy of data.
- **Biological Sampling:** Conduct biological sampling at landing sites to assess size, age, and reproductive status.
- **Social and Economic Data:** Continue collecting social and economic data on recreational and commercial fisheries needed for stock assessments and amendments.

3.2 Fishery-Independent Data Collection

- **Adult Surveys:** Conduct standardized surveys to monitor abundance trends.
- **Juvenile Recruitment Monitoring:** Conduct surveys in estuarine and nearshore nursery habitats.
- **Distribution and Stock Structure Studies:** Conduct studies to describe migration and stock structure.

3.3 Stock Assessment Enhancements

- **SEDAR Process Participation:** Ensure regular benchmark and update assessments.
- **Age and Growth Studies:** Improve age-length keys through otolith sampling.
- **Spawning Potential Ratio Proxy:** Investigate potential proxies for estimating maximum sustainable yield

4. Regulatory Impact Evaluation

- **Quota and Size Limit Effectiveness:** Assess impacts of Annual Catch Limits (ACLs) and minimum size regulations.
- **Bycatch and Discard Mortality Studies:** Implement discard survival research to refine management measures.
- **Economic Impact Assessments:** Conduct surveys to understand the economic and cultural value of the commercial and recreational fishery.
 - Track secondary, wholesale, and retail prices to better understand the value of the commercial fishery.
 - Investigate changes in price due to recreational tournaments.
- **Trip Limit Analysis:** Conduct research to better understand tradeoffs between different management options for commercial fisheries.
 - Investigate social and economic effects on the commercial fishery due to trip limits.

5. Habitat and Ecosystem Research

- **Essential Fish Habitat (EFH) Studies:** Conduct habitat mapping to identify critical areas.
- **Climate Change Impact Assessments:** Model temperature and oceanographic effects on distribution and productivity.
- **Prey and Predator Interactions:** Study trophic dynamics to inform ecosystem-based management.

6. Stakeholder Engagement and Cooperative Management

- **Fisheries Workshops and Outreach:** Enhance stakeholder involvement through meetings and training programs.
- **Collaborative Research with Fishermen:** Support cooperative research projects to incorporate industry knowledge.
- **Interstate and Federal Coordination:** Strengthen partnerships with state agencies and federal entities (e.g., NOAA, SAFMC).

7. Monitoring and Compliance Enforcement

- **Port Sampling and Dockside Monitoring:** Enhance coverage for commercial and recreational landings verification.
- **Regulation Awareness Campaigns:** Increase compliance through education and communication.

8. Future Research Priorities

- **Climate Resilience Strategies:** Develop adaptive management measures for climate-driven stock shifts.

9. Conclusion This research and monitoring plan provides a structured approach to improving the scientific understanding and management of Atlantic Migratory Group King Mackerel. Through continued advancements in data collection, stock assessment methodologies, and regulatory evaluations, fisheries managers can ensure sustainable utilization and conservation of this vital species.

Research and Monitoring Plan for Atlantic Spanish Mackerel Along the U.S. Atlantic Coast

1. Introduction

Atlantic Migratory Group Spanish Mackerel (*Scomberomorus maculatus*) is a key species in commercial and recreational fisheries along the U.S. Atlantic coast. Effective management requires robust research and monitoring efforts guided by assessments conducted through the Southeast Data, Assessment, and Review (SEDAR) process and amendments to the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources in the Gulf of Mexico and Atlantic Regions. This plan outlines strategies to enhance data collection, stock assessments, and management.

2. Objectives

1. Improve stock assessment accuracy by refining data collection and modeling.
2. Enhance biological and ecological understanding of Spanish mackerel populations.
3. Monitor fishing pressure and compliance with regulatory measures.
4. Assess habitat use and environmental impacts on stock distribution.
5. Evaluate social and economic factors affecting the fishery.

3. Data Collection and Stock Assessments

3.1 Fishery-Dependent Data Collection

- **Commercial Landings and Effort Surveys:** Continue mandatory reporting of commercial catches through state and federal programs.
- **Recreational Catch Surveys:** Utilize the Marine Recreational Information Program (MRIP) for angler catch estimates.
 - Improve estimation of shore-based catches.
 - Consider new methods to collect recreational catch data
 - Enhance angler reporting through mobile applications and citizen science initiatives.
- **Observer Programs:** Expand observer coverage to improve bycatch estimates and validate self-reported data.
- **Electronic Reporting and Logbooks:** Enhance electronic monitoring to improve timeliness and accuracy of data.
- **Biological Sampling:** Conduct biological sampling at landing sites to assess size, age, and reproductive status.
- **Social and Economic Data:** Continue collecting social and economic data on recreational and commercial fisheries needed for stock assessments and amendments.

3.2 Fishery-Independent Surveys and Data Collection

- **Adult Abundance Surveys:** Conduct standardized surveys to monitor abundance trends.
 - Improve methods to track abundance along the Atlantic Coast by developing calibration between NEAMAP and SEAMAP
- **Juvenile Recruitment Monitoring:** Conduct surveys in estuarine and nearshore ocean nursery habitats.
 - Develop methods to integrate data collected through multiple surveys collected by state and federal agencies.
- **Distribution and Stock Structure Studies:** Conduct studies to describe migration and stock structure.

3.3 Stock Assessment Enhancements

- **SEDAR Process:** Ensure regular benchmark and update assessments.
- **Age and Growth Studies:** Improve age-length keys through otolith sampling.
- **Natural Mortality:** Investigate natural mortality to determine appropriate value.
- **Spawning Potential Ratio Proxy:** Investigate potential proxies for estimating maximum sustainable yield

4. Regulatory Impact Evaluation

- **Quota and Size Limit Effectiveness:** Assess impacts of Annual Catch Limits (ACLs) and minimum size regulations.
- **Bycatch and Discard Mortality Studies:** Implement discard survival research to refine management measures.
- **Social and Economic Impact Assessments:** Conduct surveys to understand the economic and cultural value of the commercial and recreational fishery.
 - Track secondary, wholesale, and retail prices to better understand the value of the commercial fishery.
- **Discrete Choice Models:** Conduct research to better understand tradeoffs between different management options for for-hire and recreational fisheries
 - Investigate different seasons and bag limits for the recreational sector that would be useful for understanding tradeoffs with reduced catch limits.

5. Habitat and Ecosystem Research

- **Essential Fish Habitat (EFH) Studies:** Conduct habitat mapping to identify critical areas.

- **Climate and Oceanographic Data Integration:** Analyze impacts of temperature, salinity, and ocean currents on Spanish mackerel distribution.
- **Prey and Predator Interactions:** Study trophic dynamics to inform ecosystem-based management.

6. Stakeholder Engagement and Cooperative Management

- **Fisheries Workshops and Outreach:** Enhance stakeholder involvement through meetings and training programs.
- **Collaborative Research with Fishermen:** Support cooperative research projects to incorporate industry knowledge.
- **Interstate and Federal Coordination:** Strengthen partnerships with state agencies and federal entities (e.g., NOAA, SAFMC).

7. Management Strategies

- **Regulatory Amendment and Management Measures**
 - Implement annual catch limits (ACLs) based on stock assessments.
 - Maintain accountability measures such as seasonal closures and bag limits.
 - Improve bycatch reduction strategies and enforce gear restrictions.
- **Adaptive Management Framework**
 - Establish a rapid response mechanism for adjusting regulations based on new data.
 - Incorporate climate change projections into long-term stock sustainability planning.
 - Foster cross-agency collaboration with NOAA Fisheries, Atlantic States Marine Fisheries Commission, state agencies, and academia.

8. Monitoring and Compliance Enforcement

- **Port Sampling and Dockside Monitoring:** Enhance coverage for commercial and recreational fisheries.
- **Regulation Awareness Campaigns:** Increase compliance through education and communication.

8. Future Research Priorities

- **Climate Resilience Strategies:** Develop adaptive management measures for climate-driven stock shifts.

9. Conclusion This research and monitoring plan provides a structured approach to improving the scientific understanding and management of Atlantic Migratory Spanish Mackerel. Through

continued advancements in data collection, stock assessment methodologies, and regulatory evaluations, fisheries managers can ensure sustainable utilization and conservation of this vital species.